



Environmental Engineering



Definition

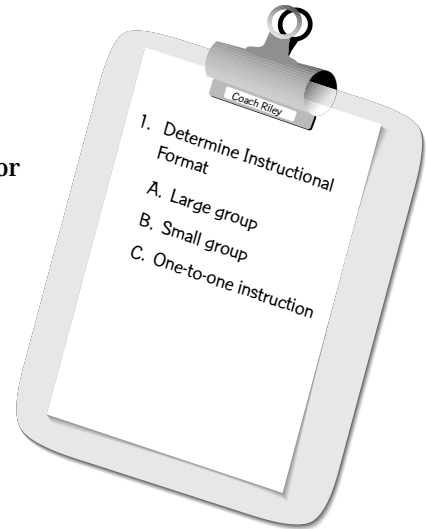
Environmental engineering is a formal term for the process of arranging the physical environment of the classroom to enhance student learning and behavior. The physical environment of the classroom serves as a complex set of stimuli that may significantly influence appropriate or inappropriate behaviors. Instructors can positively affect student performance by paying careful attention to such factors as the basic layout of classroom space, wall displays, traffic patterns, and other more subtle aspects of the physical environment.

Things to Do

- ✓ Determine the instructional format used most frequently.
- ✓ Arrange student seating.
- ✓ Designate specific purposes to each area of the classroom.

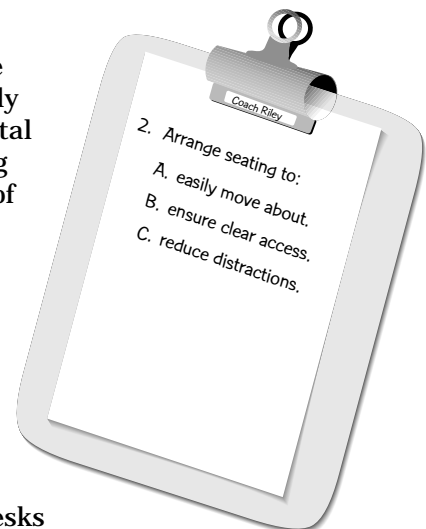
✓ Determine the instructional format used most frequently.

If large-group instruction is employed, classroom seating arrangements should allow students to view the instructor with ease. If small-group instruction is used, a small table or area large enough to accommodate all students and the teacher must be available. Similarly, if one-to-one instruction is used, a work area where both the instructor and student can be seated comfortably should also be available. Many contemporary curriculum method textbooks offer diagrams of classroom physical layouts that address a variety of instructional situations.



✓ Arrange student seating.

Students with behavior problems should be seated near the instructor to help prevent problems. Students who are easily distracted should be seated in areas where the environmental stimuli are not excessively distracting. However the seating arrangements are configured, they should offer clear lines of sight from student to instructor and instructor to each student.



Provide for Easy Instructor Movement Throughout the Classroom

Hurdling chairs, desks, or other obstacles or squeezing between rows of desks and chairs interfere with the instructor's ability to easily move from one part of the classroom to another to respond to student requests for assistance or provide proximity control as a means to redirect student attention.

Heighten the Instructional Impact of Bulletin Boards

If bulletin boards are to be used and they convey important information (e.g., classroom rules and consequences), make sure that they are designed attractively and that student attention can be easily directed to them.

Ensure That the Physical Design of the Classroom is Appropriate to Meet the Needs of Students with Impairments

The classroom must be accessible to students in wheelchairs, braces, or who use other forms of mobility assistive devices. Appropriate seating arrangements are essential for students with hearing impairments. Students with visual impairments need to be oriented to the physical layout of the classroom and informed when any changes are made.

✓ Designate specific purposes to each area of the classroom.

Designating specific areas of the classroom as work areas and other areas as play or free-time areas may help to heighten the student's awareness of the behavioral expectations governing his behavior in certain locations in the classroom.

Label Specific Areas

It may also be useful to label specific areas as "off limits" (e.g., file cabinets or the teacher's desk) to clarify expectations concerning student behavior.



Designate Areas Outside the Classroom That are Off Limits

Locations with no clear purpose encourages "loitering" or "hanging out" behaviors that may escalate into more problematic misbehavior.

Examples

Example 1

Jim is very talkative and distractible and his rate of off-task behavior is very high. He sits in the back of the classroom near the exit door in the seat farthest away from the instructor. The instructor changes his seating assignment to the area of the classroom where she most frequently is located.

Verbal prompts and admonitions have been unsuccessful, and the noise level continues virtually unabated. To address the problem in a positive manner, the principal installs a homemade "stoplight" device in a prominent place in the cafeteria. The stoplight features a green light, yellow light, and red light.

Example 2

The school principal is concerned with noise level in the school cafeteria during lunch time. It sometimes approaches din-like proportions.

The principal visits each classroom in the school to explain and demonstrate the stoplight. He tells students that the green light will be activated when the noise level is appropriate. If the noise level escalates beyond acceptable levels, the yellow light will be turned on as a warning

for the students to “slow down.” If the noise level reaches unacceptable levels, the red light will be switched on. Further, the principal informs the students that the amount of “green light time” will be tracked and surprise treats and activities will be provided to all lunch eaters every once in

a while if improvement in the noise level is observed. This procedure was employed over a 2-month period, and dramatic improvements were observed. The principal began systematically fading the use of the stoplight without a significant deterioration in the target behavior.

Variations of the Technique

- 👉 For younger and more impulsive students, actually marking the student’s space around his work area or in a small-group instructional area has been employed.
- 👉 Another somewhat more elaborate method of engineering the environment involves the introduction of a signaling device that

serves as a discriminative stimulus for appropriate or inappropriate behavior. For example, “clocklight” or “spotlight” systems have been implemented in classrooms or cafeteria settings to signal students when their behavior meets expectations. Typically, the use of these devices also involve a token reinforcement system.

Potential Problems and Solutions

Instructor Makes Sudden Change in Basic Arrangement of Classroom

For many students with disabilities, a well-designed classroom provides structure and security. Altering the familiar arrangement may be unsettling to some students. If changes are made, announce them ahead of time to the students and provide a rationale for the changes.

External Signaling Devices Are Not Faded

When a relatively obtrusive device such as a “clocklight” is used, it is extremely important—as it is with any external behavior management intervention—to systematically fade the use of such devices on a gradual basis during the school year.

Getting Ready

- 👉 The specific nature of an engineered physical environment depends on the instructional programming that occurs, the students, and the nature of the physical space itself. Consider such factors as the ease of teacher observation and movement throughout the classroom space, physical proximity of students to each other, and designated work areas. When student performance problems occur, analyze whether the problems can be traced to

a problem within the physical environment that can be modified relatively easily.

- 👉 Carefully engineered classrooms can be an effective preventive technique when implemented at the beginning of the school year. However, modifying the classroom environment can also be a low-cost effective intervention to try when student performance problems occur.

Materials and Supplies

The choice of materials and supplies for this intervention are vast. Tables, desks, chairs of various shapes and sizes, partitions, bulletin boards, audiovisual equipment, and other materials all make up the rich physical environment that can be carefully designed and engineered by the instructor.



References

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Rosenberg, M. S., O'Shea, D. J. (1991). *Student teacher to master teacher: A handbook for preservice and beginning teachers of students with mild and moderate handicaps*. New York: Macmillan.